

# Data Archive and Remote Observing

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# The CHARA Server

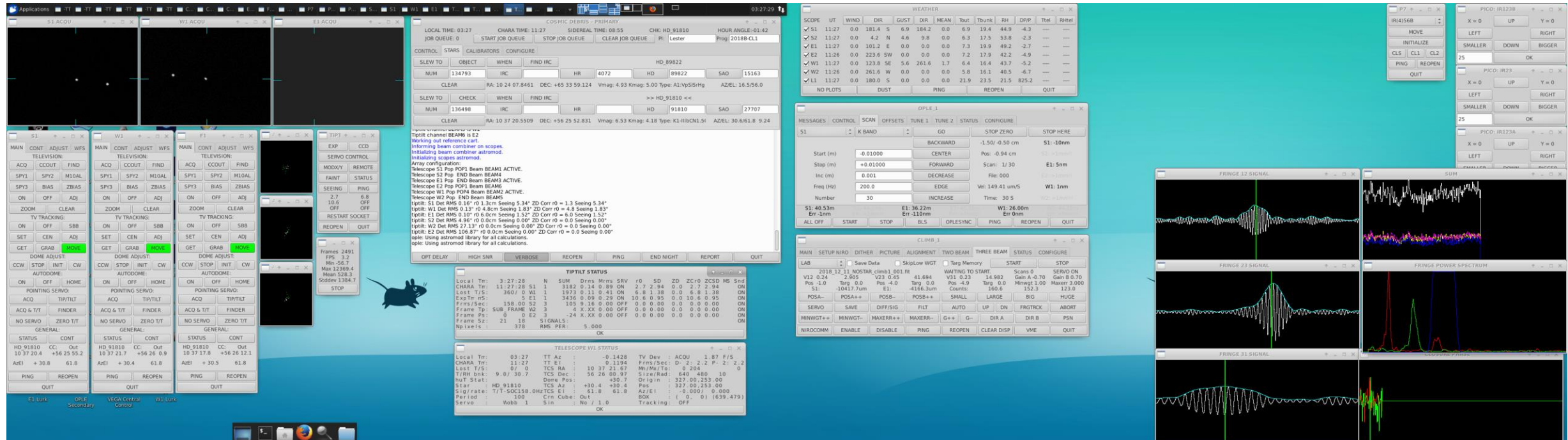
- Located at GSU Data Center
- 3 Virtual Machines:
  - Remote Observing
  - Remote Data Reduction
  - Archive + Database







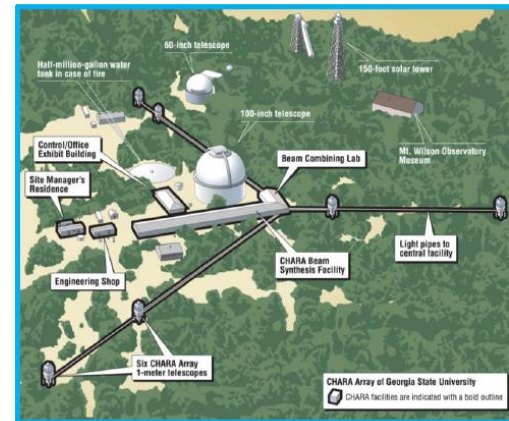
# Remote Observing



Screenshot courtesy of Katie Lester

# Remote Observing

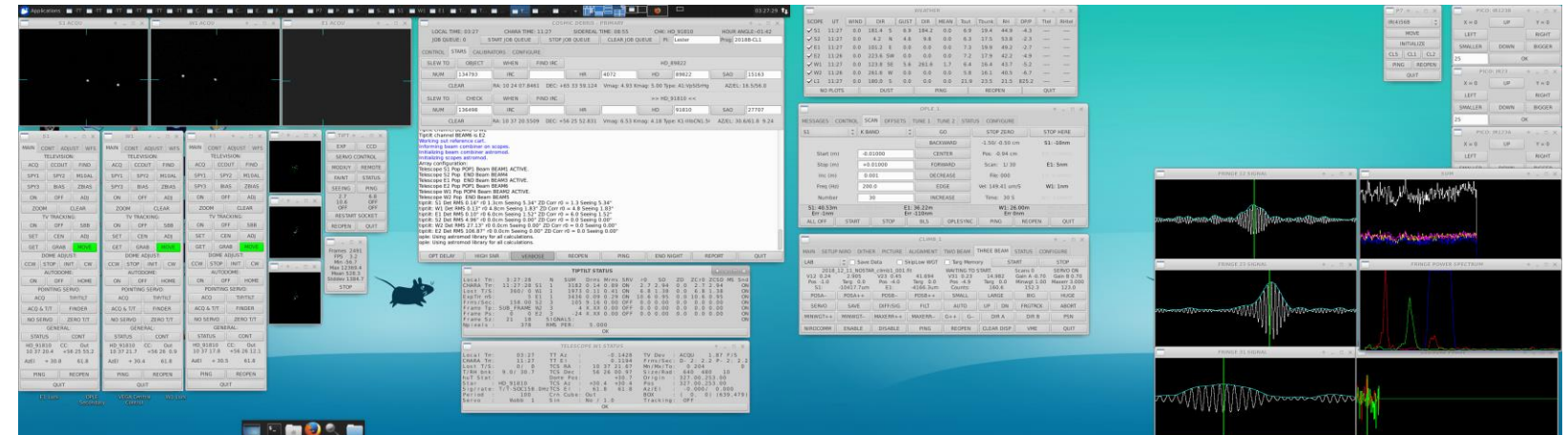
- Connect to Atlanta machine using VNC
- Atlanta machine connects to mountain using SSH tunnel
- CHARA software is the same as that on the mountain



ssh tunnel

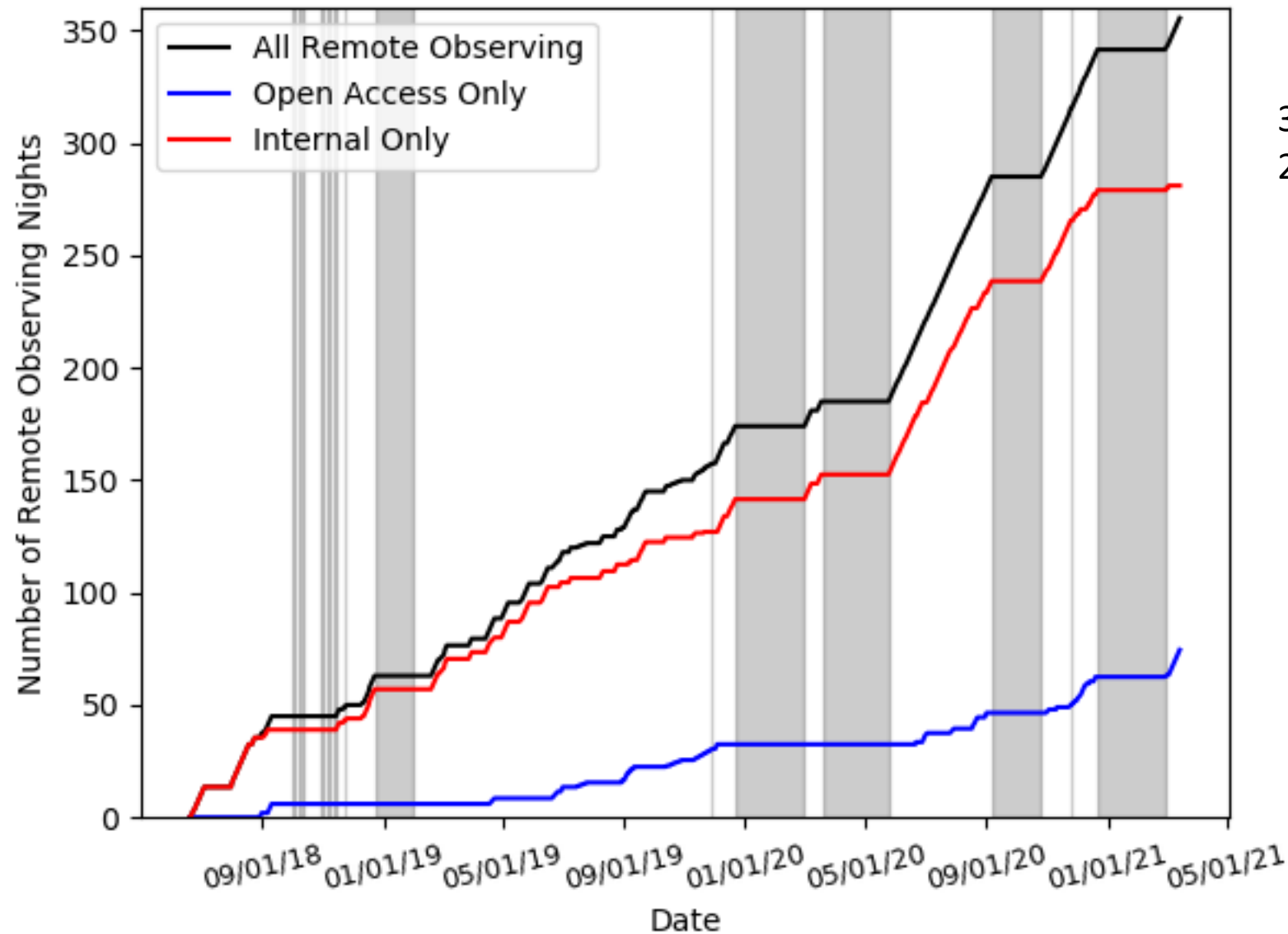


VNC





# Remote Observing Stats

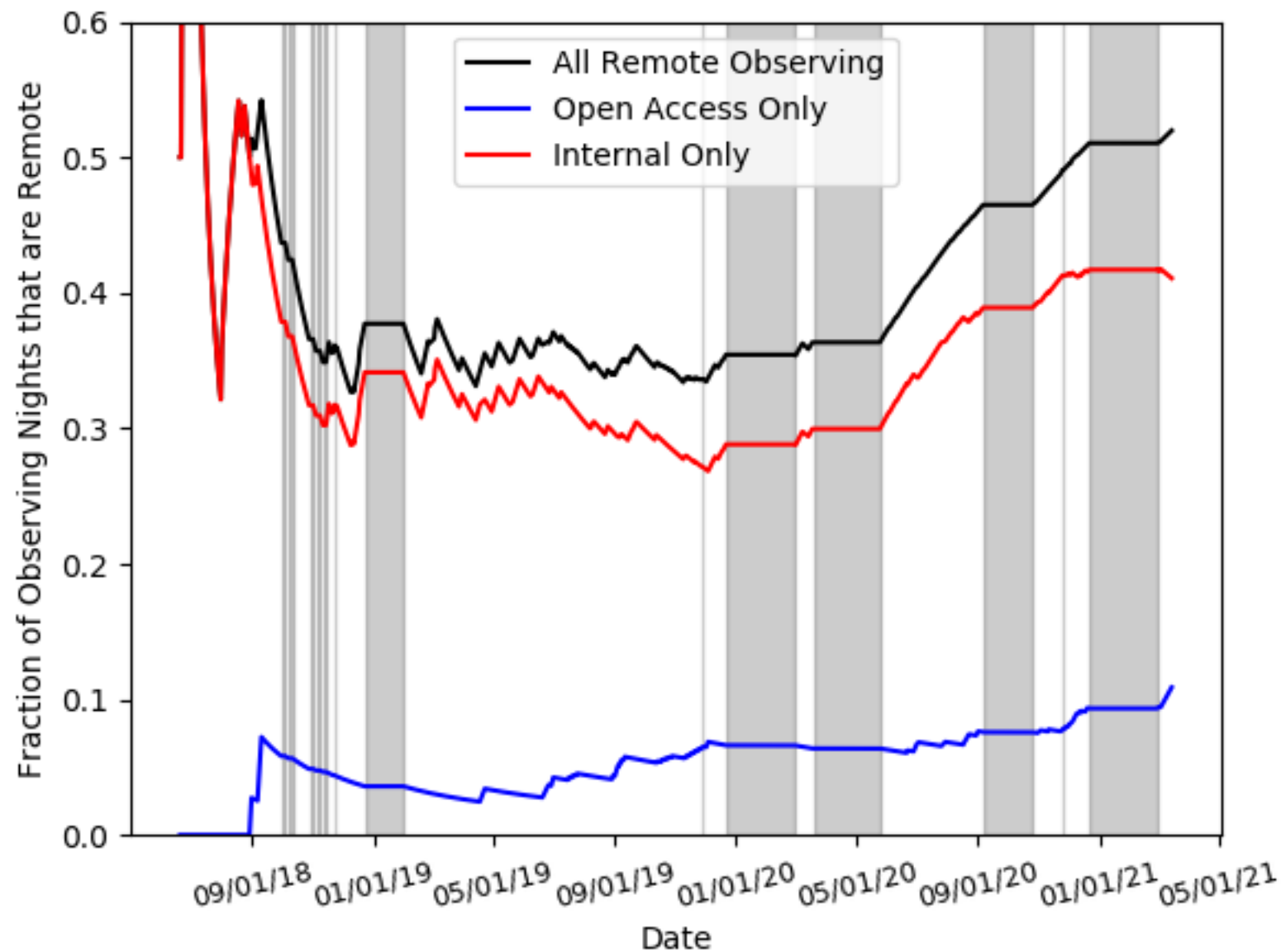


356 Remote Nights  
281 Internal  
75 Open Access





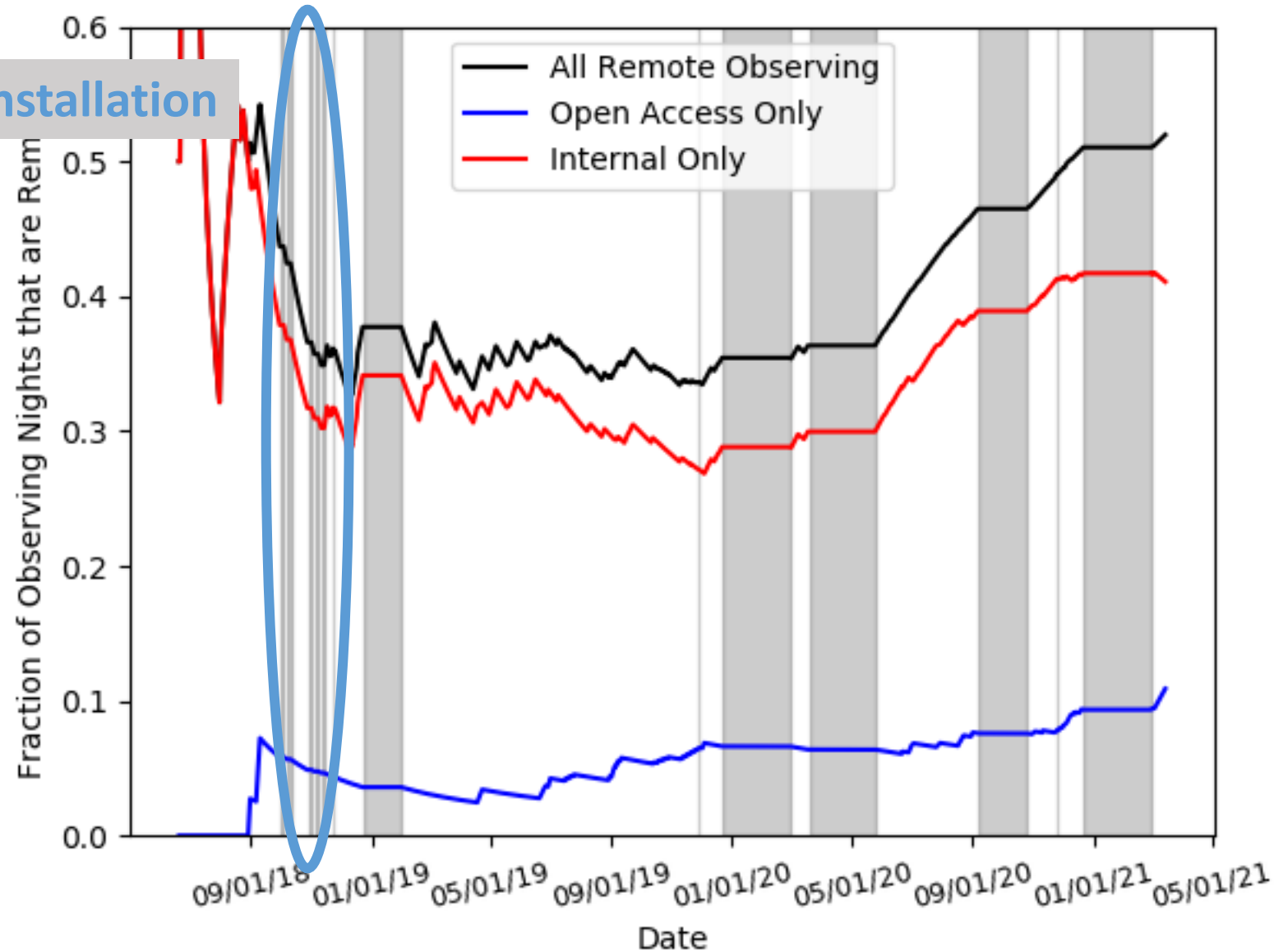
# Remote Observing Stats



52% Remote Nights  
41% Internal  
11% Open Access

# Remote Observing Stats

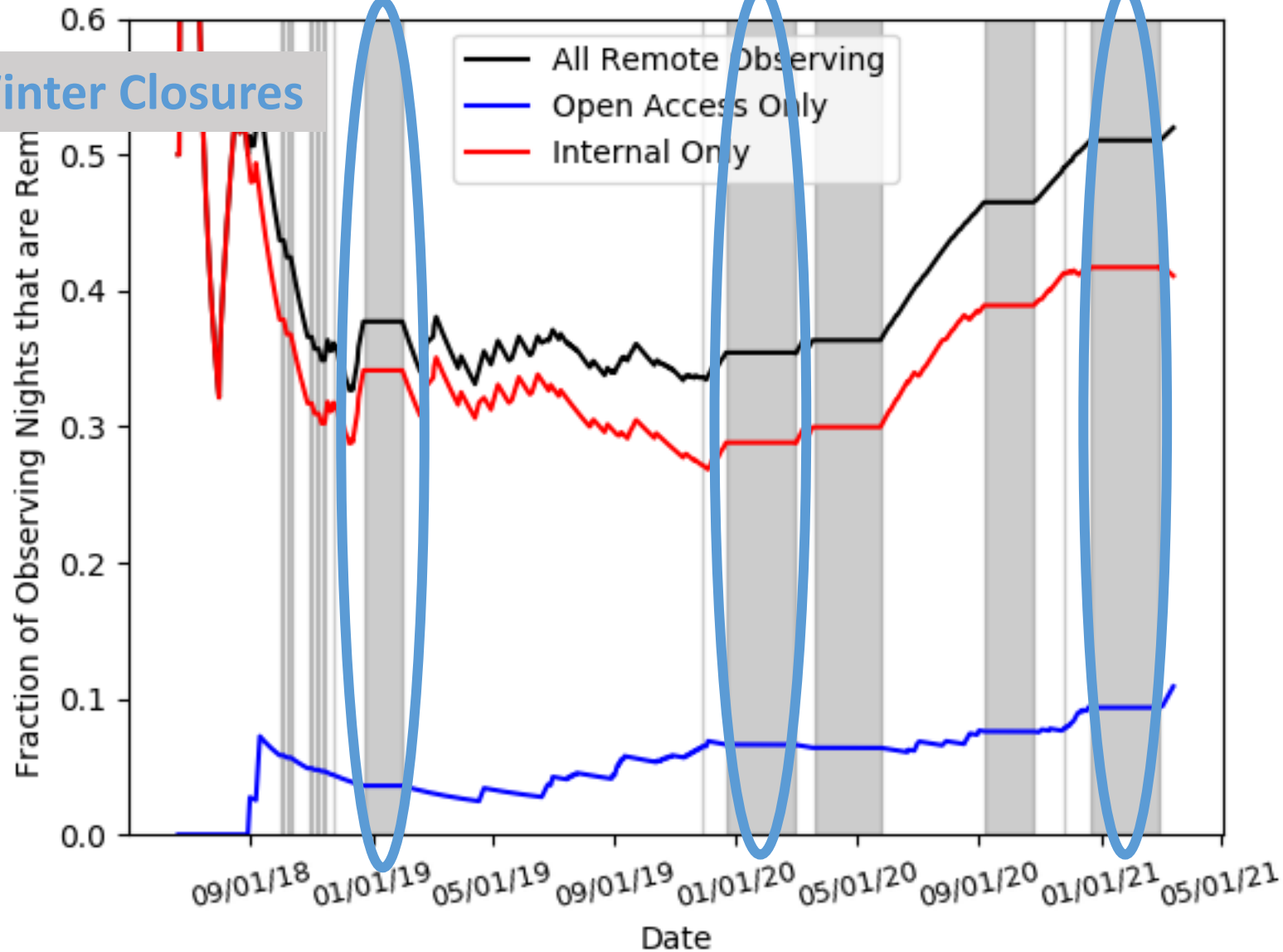
Initial AO Installation



52% Remote Nights  
41% Internal  
11% Open Access

# Remote Observing Stats

Normal Winter Closures

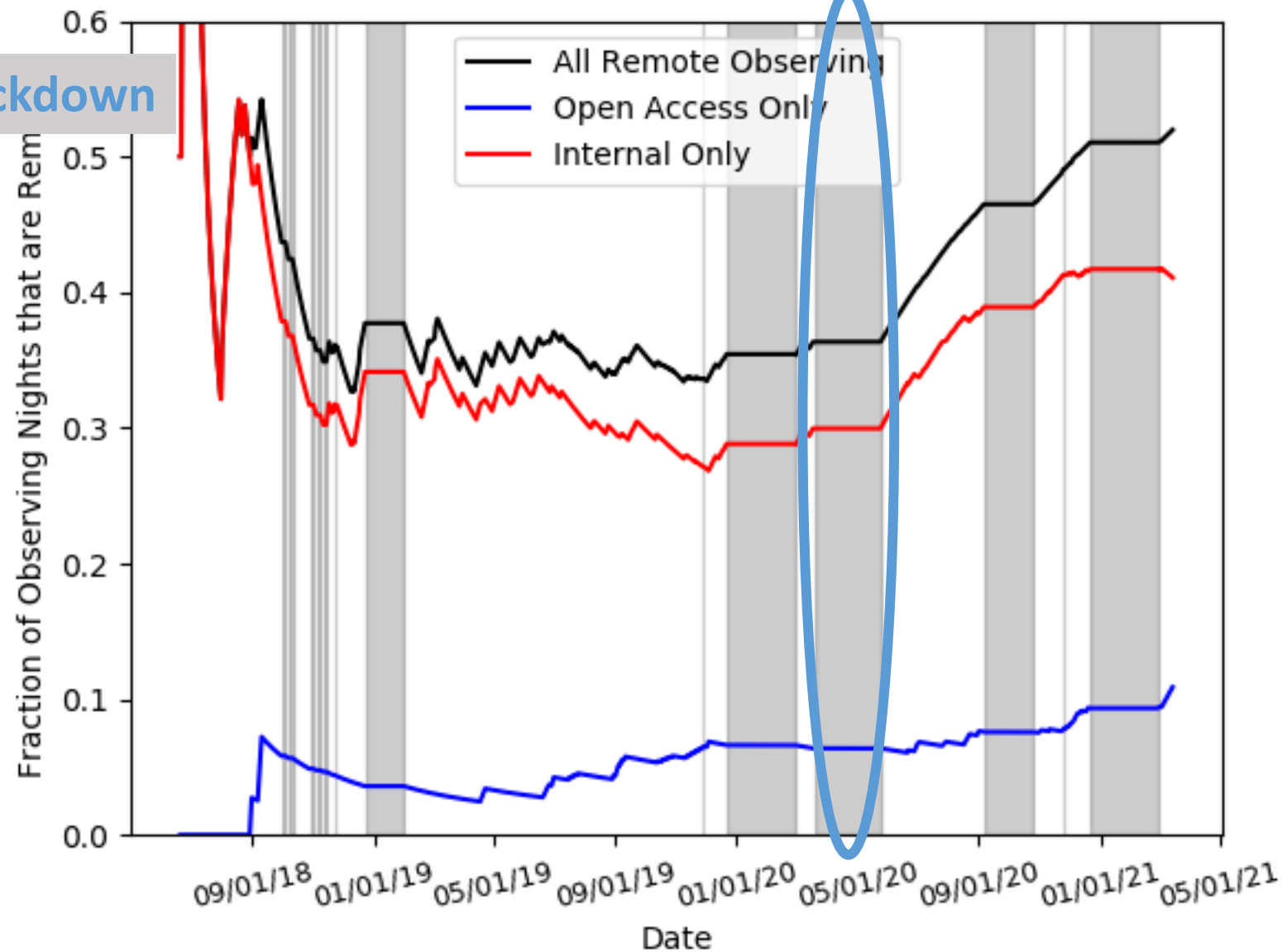


52% Remote Nights  
41% Internal  
11% Open Access



# Remote Observing Stats

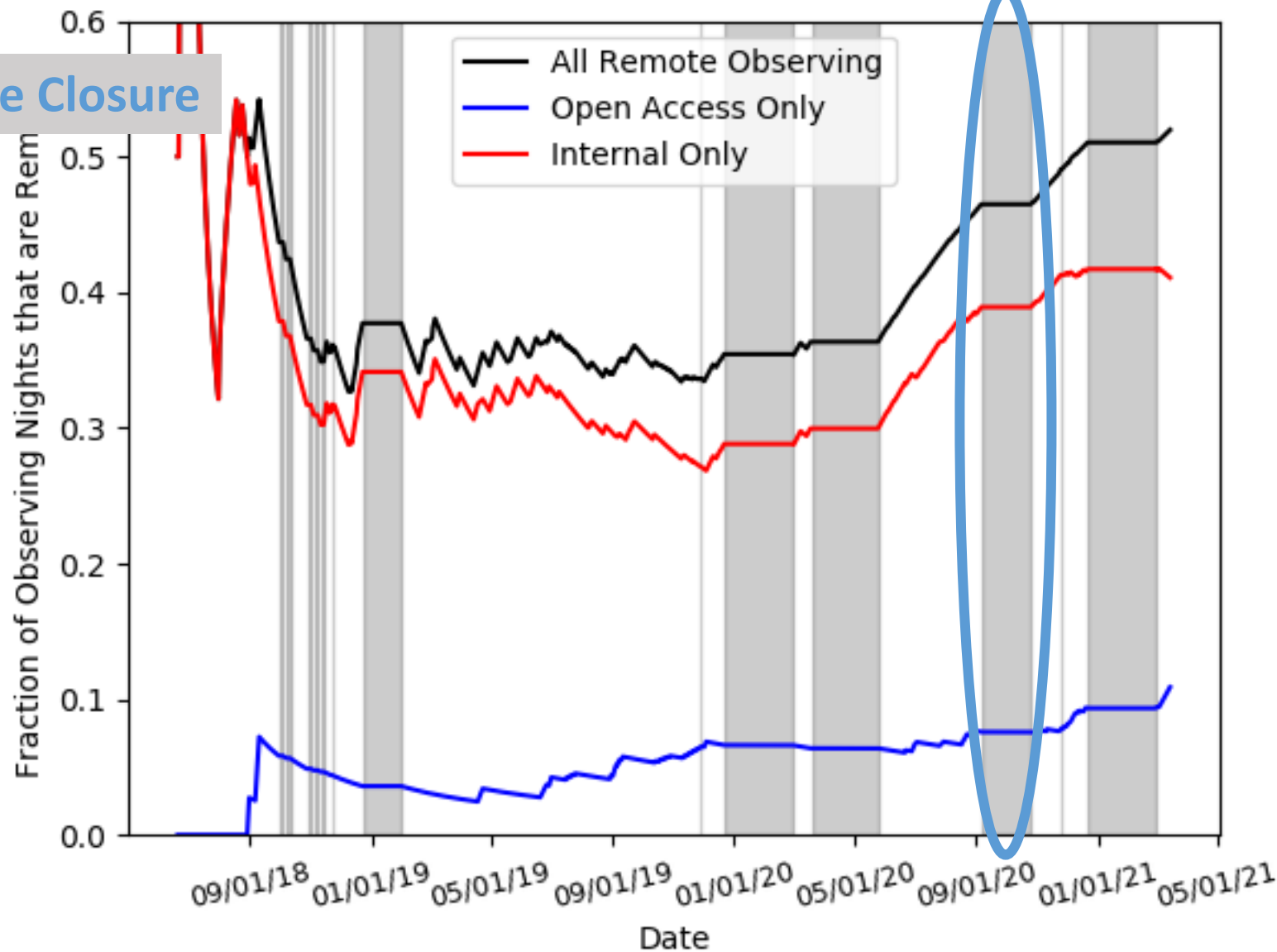
COVID Lockdown



52% Remote Nights  
41% Internal  
11% Open Access

# Remote Observing Stats

Bobcat Fire Closure

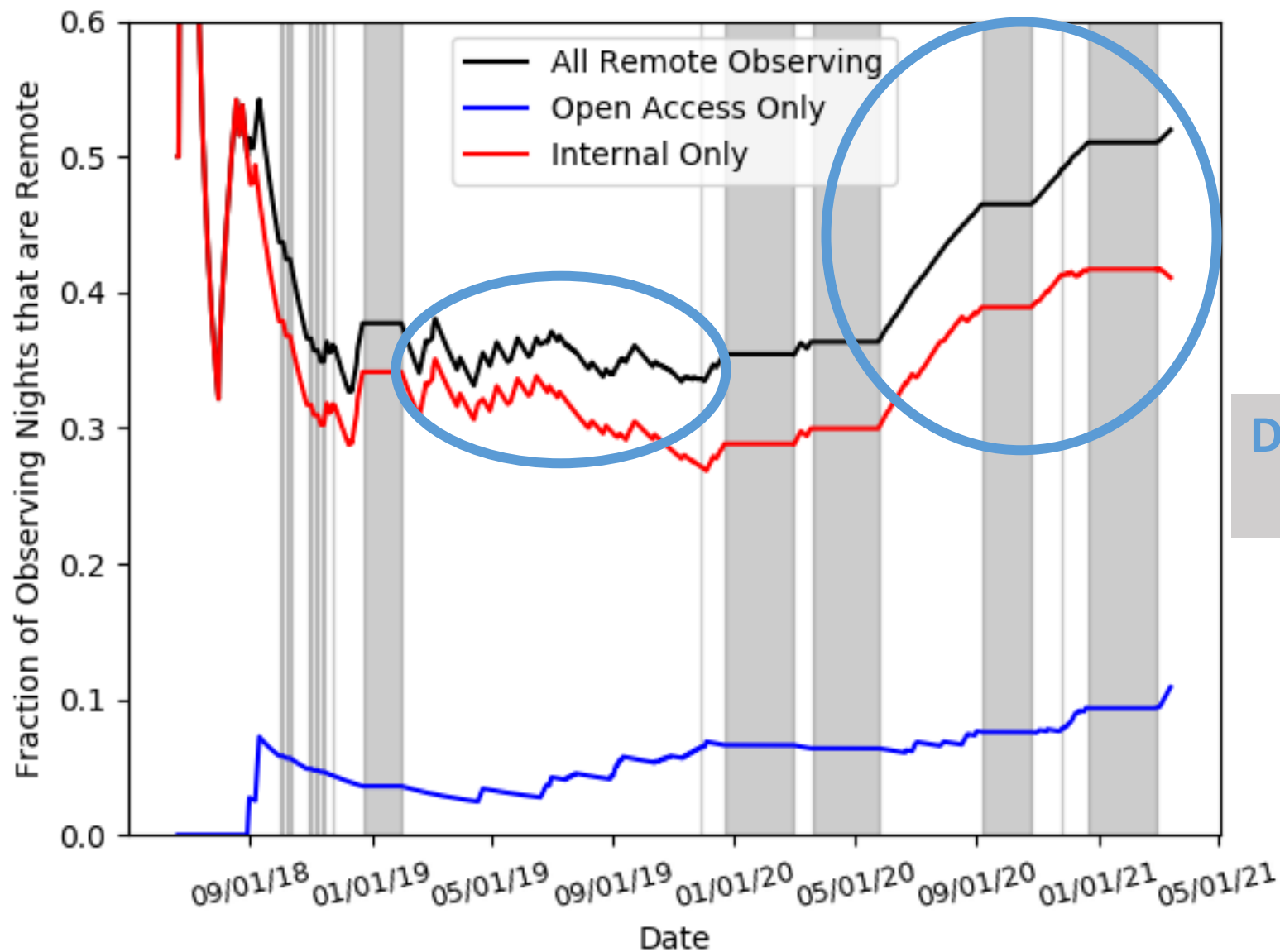


52% Remote Nights  
41% Internal  
11% Open Access



# Remote Observing Stats

Normally,  
~1/3 Nights  
Remote



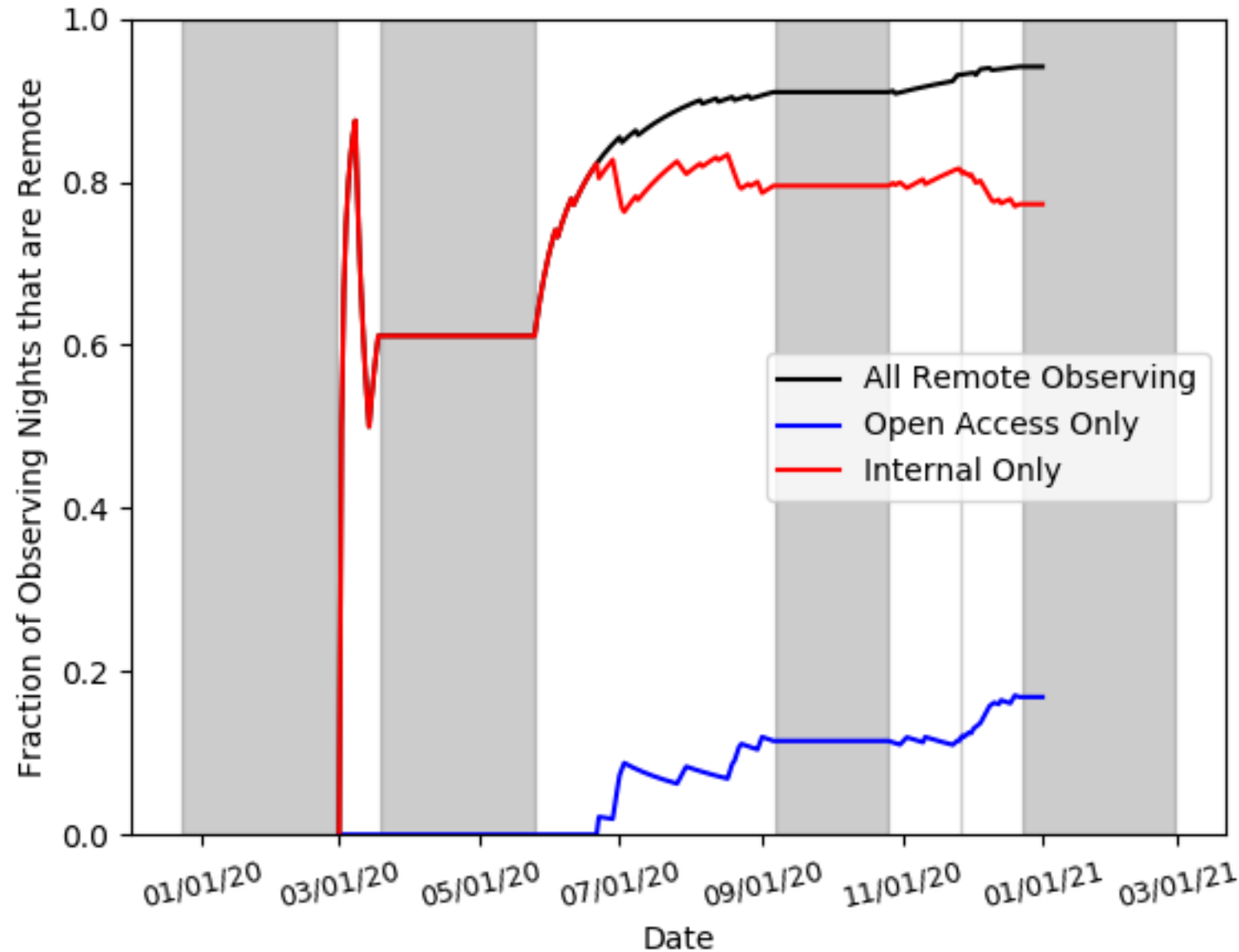
52% Remote Nights  
41% Internal  
11% Open Access

During Pandemic,  
100% Remote





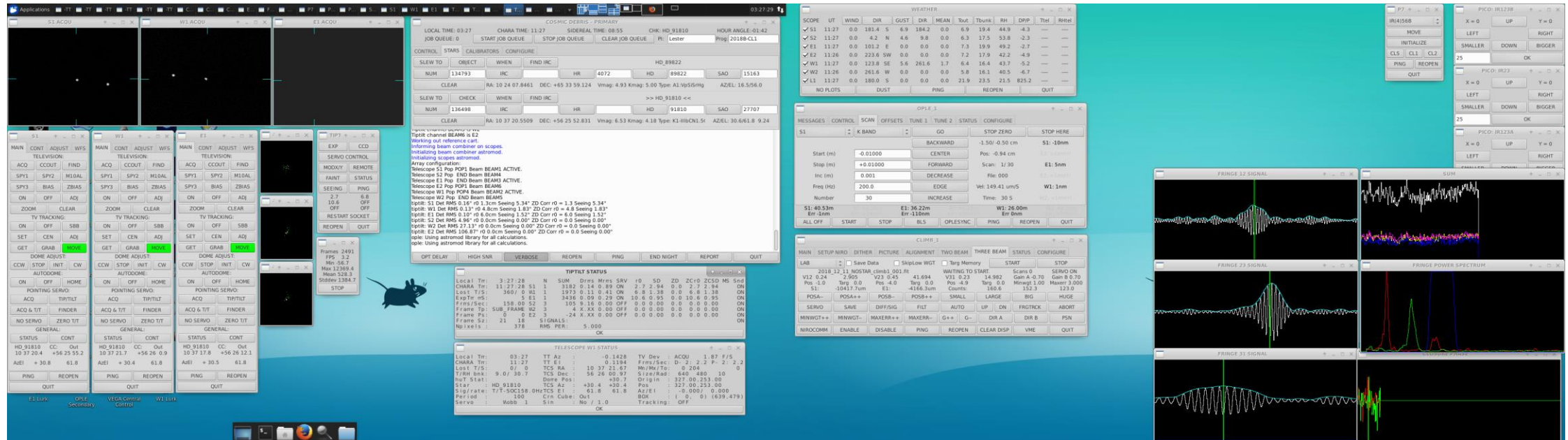
# Remote Observing Stats (2020 Only)



94% Remote Nights  
77% Internal  
17% Open Access



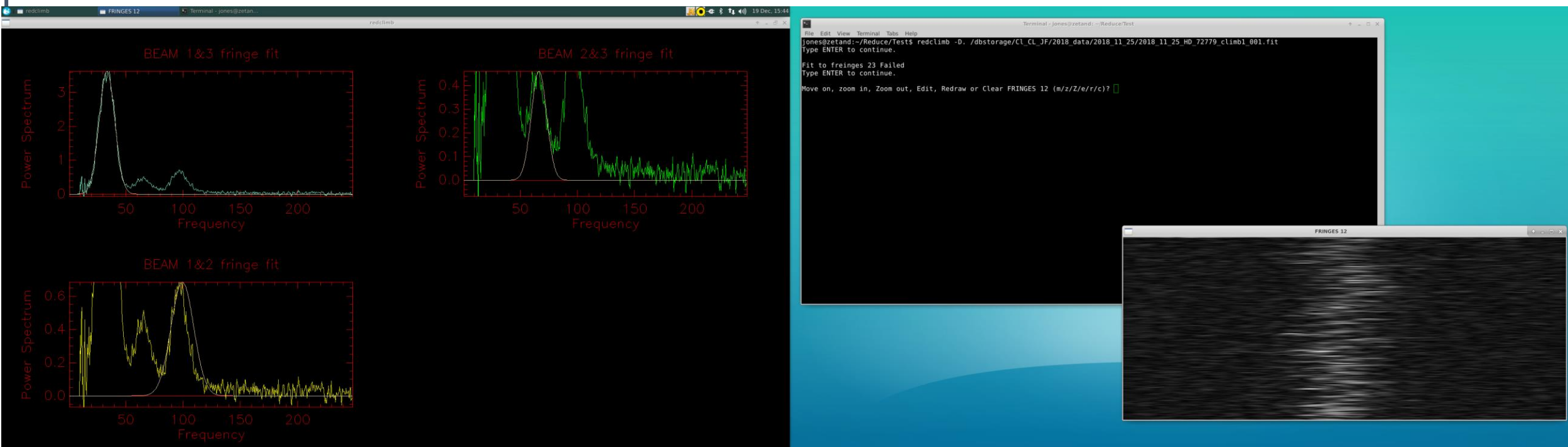
# Remote Observing Conclusions



Popular... but also mandatory



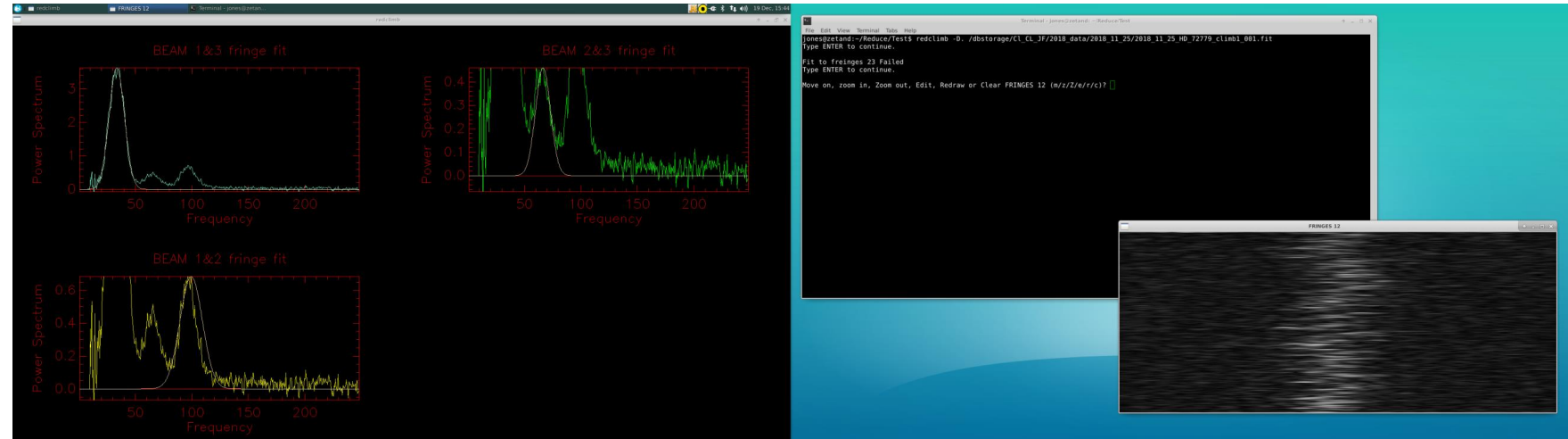
# Remote Data Reduction





# Remote Data Reduction

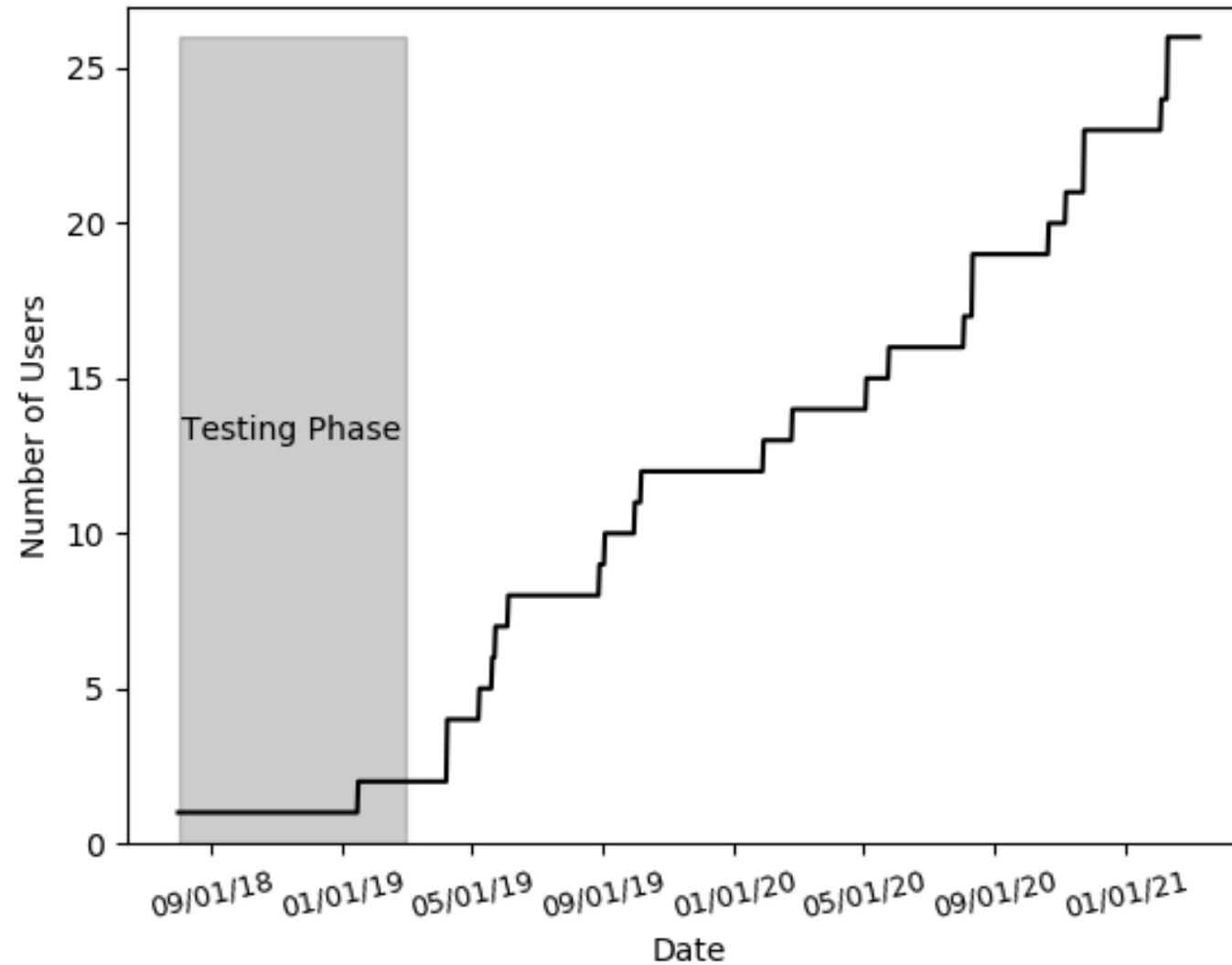
- Data Reduction Machine linked to archive
- Reduce data remotely
- Download final reduction
- **Benefits:**
  - Reduction software always up to date
  - No need to download raw data
  - Cross-platform







# Remote Data Reduction



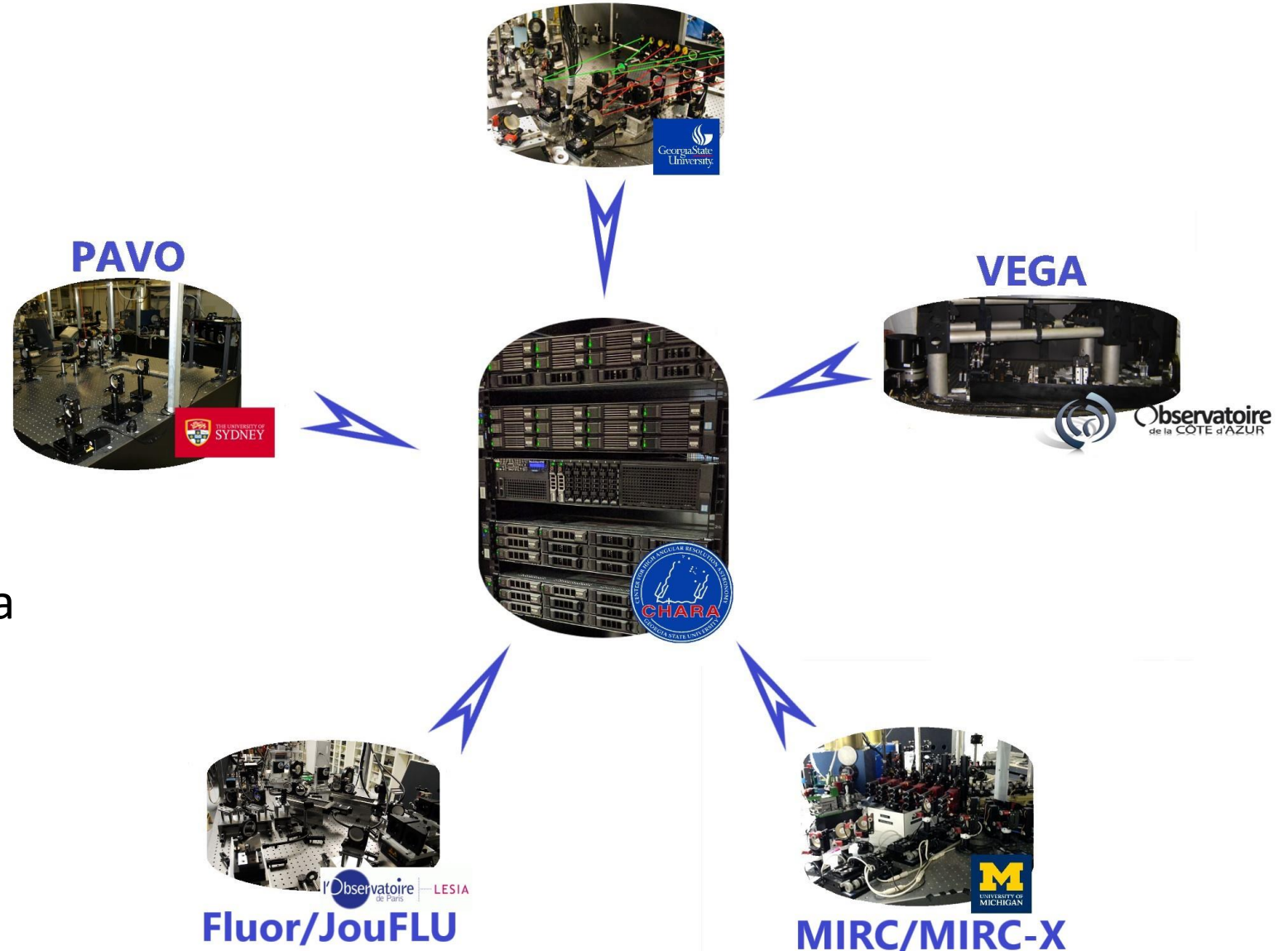
26 Users  
~1 User/Month



# Atlanta Archive

Classic/CLIMB

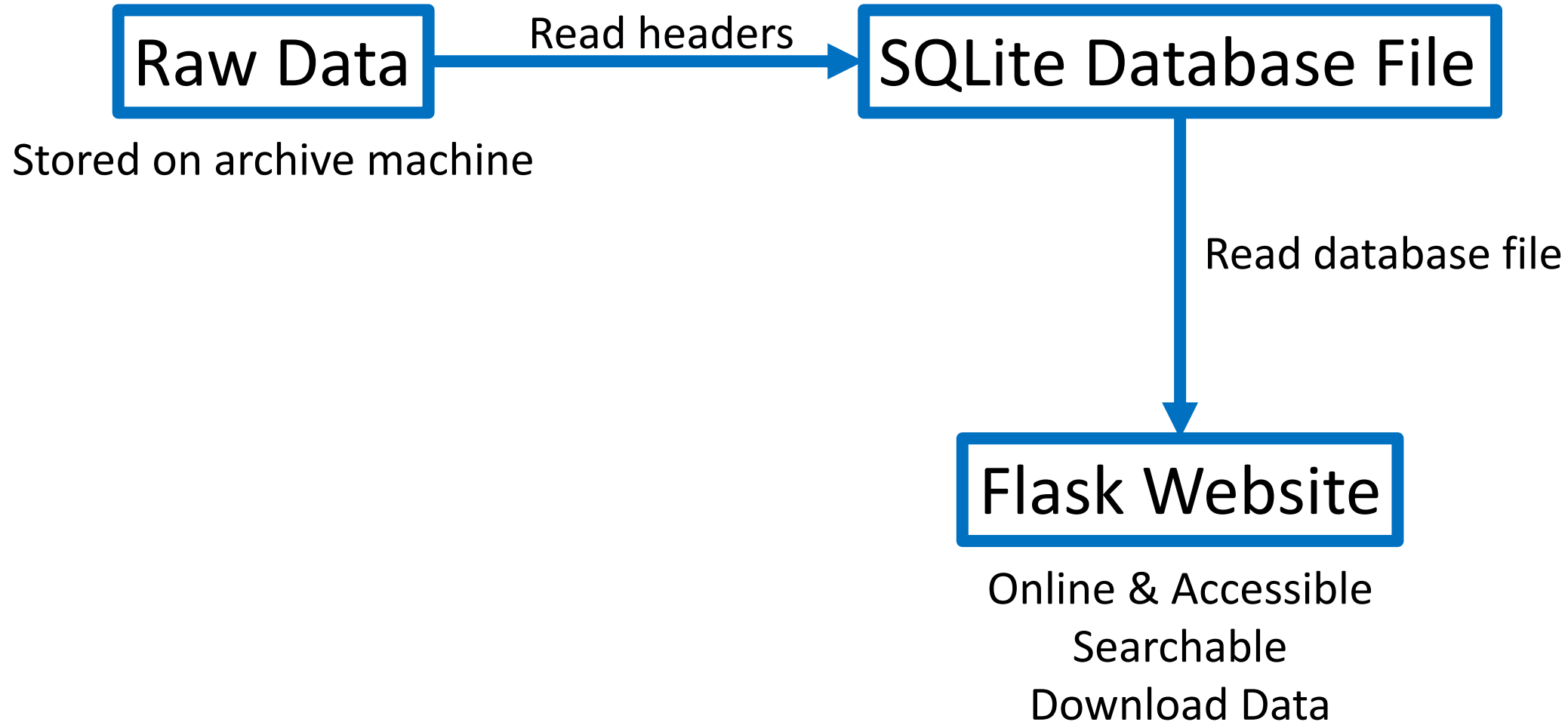
- Consolidated Archive
- 100 TB, with room for more
- We have:
  - Most raw data
  - Some “autoreduced” data
  - Some published data





# Online Database Preview

## The Goal



# Online Database Preview

Database File:

CHARA\_database.db

Tables:

classic

climb\_1

climb\_2

fluor

jouflu

mirc

mircx

pavo

vega

Advanced Search

The One Table to Rule them All:



all\_chara

Default Search





# Online Database Preview

## CHARA Database Query Form

Select a database:

- ☐ Classic
- ☐ CLIMB 1
- ☐ CLIMB 2
- ☐ PAVO
- ☐ MIRC-X
- ☐ MIRC

Submit



# Online Database Preview

## CHARA Database Query Form

Star Name

HD\_128165

Start Date

05 / 01 / 2018

End Date

05 / 31 / 2018

Display:

id  
SIMPLE  
BITPIX  
NAXIS

Submit

SQL Command) SELECT CCSTARHD,CCOBJTYP,CCUTDATE,CCUTTIME,CC\_BEAM5,CC\_BEAM6 FROM classic WHERE CCSTARHD = 'HD\_128165' AND date(CCUTDATE) >= date('2018-05-01') AND date(CCUTDATE) <= date('2018-05-31')

| CCSTARHD  | CCOBJTYP | CCUTDATE   | CCUTTIME     | CC_BEAM5 | CC_BEAM6 |
|-----------|----------|------------|--------------|----------|----------|
| HD_128165 | OBJECT   | 2018-05-04 | 11 02 11.709 | E1       | W1       |
| HD_128165 | OBJECT   | 2018-05-04 | 11 53 15.724 | E1       | W1       |
| HD_128165 | OBJECT   | 2018-05-04 | 12 29 33.107 | E1       | W1       |
| HD_128165 | OBJECT   | 2018-05-05 | 10 45 51.115 | E1       | S1       |
| HD_128165 | OBJECT   | 2018-05-05 | 11 25 58.616 | E1       | S1       |



# Online Database Timeline

- Minimum Working Prototype
  - Something from all Combiners
  - Technique for Creating “all\_chara” table
  - April 2021
- Full Version
  - All Data
  - Feedback Incorporated
  - Fall 2021



# Summary

Remote Observing



Archive + Database

Remote Data Reduction